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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/665,334	09/18/2003	Stephen R. Barnes	2003PI1510US	5441

7590 01/10/2007  
Siemens Corporation  
Intellectual Property Department  
170 Wood Avenue South  
Iselin, NJ 08830

EXAMINER
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JAWORSKI, FRANCIS J

ART UNIT	PAPER NUMBER
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3768

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/10/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

## Office Action Summary

**Application No.**

10/665,334

**Applicant(s)**

BARNES, STEPHEN R.

**Examiner**

Jaworski Francis J.

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 9/18/3,11/24/3.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1 - 27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 - 27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>9/18/3,11/24/3</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Specification***

The disclosure is objected to because of the following informalities: para [0006] typo error to -- Rayleigh --.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 – 2 and 4 – 5 are rejected under 35 U.S.C. 102(b) as being anticipated by Strozeski (US5146050) . Noting that ‘transducer ‘ in the claim is to be construed generically per spec para [0020] final portion, Strozeski teaches in col. 6 lines 22 – 42 and col. 7 lines 1 – 27 that by having a portion of the backing interface 162, 163 conical and tapered between backing portions 152 and 154, off-axis scattering back into the backing 152 with total absorption will occur, this being tantamount to the terminology ‘anechoic’ /echo-inhibiting surface within the composite backing 152, 154 since no backing echo reaches transducer 150. Additionally it appears that the mentioned interface acts as a “Rayleigh dump” since it both causes off-axis scattering and an acoustic sink effect within 152 as a result.3

Claims 1, 3, 5 – 7, 27 are rejected under 35 U.S.C. 102(b) as being anticipated by Miller (US5267221) in that Miller teaches apparatus and method exemplarily in col. 6

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lines 11 – 69 backing layer of impedance similar to the transducer such that no energy will eventually reflect back thereinto (and therefore the interface with the second acoustic layer of lower velocity which wicks the acoustic energy in anti-waveguide fashion being an ‘anechoic surface’ the combination of the first and second backing serving to absorb all reflective energy for the transducer array mounted to the backing block.

Claims 1, 4 – 5 and 7 – 8 and 24 – 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Bar-Cohen (US4698541) where transducer 12 is backed by a composite two – part backing layer 14, 16 with the first part 14 comprised of a metal alloy and impedance-matched to the transducer and the second part 16 which is of a different composite and although matched to the first part is highly absorptive. Therefore the second scattering surface of 14 which apposes 16 may be considered an anechoic surface since the acoustic energy crossing it is absorbed and does not return or reflect as an artifact echo. Again, since the interface is both angulated and roughened to deliberately create scattering, the composite effect is that of a Rayleigh dump or sink where energy is scattered and sunk into an absorptive terminus.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2 and 21 – 23, 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bar-Cohen as applied to claim 1 above, and further in view of Friemel (US6537220) or Robinson (US6659954). Whereas the former is silent as to the use of a backing layer with for example cMUT –type devices, it would have been obvious in view of Friemel et al 508 to use conventional backing layers where the cMUT is simply treated as an equivalent to piezoelectric array element designs, or in view of Robinson col. 1 lines 12 – 32 considered together with col. 5 lines 15-33 to use a wholly attenuative backing layer with acMUT in order to avoid deteriorating sensitivity as well as to provide array support during fabrication.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bar-Cohen as applied to claim 1 above, and further in view of Hazony et al (US5612930) insofar as whereas the former may be argued to be deficient regarding whether the anechoic function occurs at the roughened surface and/or whether such a surface has sufficient re's metallic element 20 and col. 3 lines 15 – 35 and col. 4 lines 25 – 44 to form regular peaks and valleys in the anechoic surface and to dissipate arriving acoustic waves by virtue of action at this surface.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bar-Cohen as applied to claim 8 above, and further in view of Frey (US5711058) insofar as the latter teaches that if aluminum alloy is used as a backing layer as is used in the former, then 46 of Frey Fig. 5B will additionally have high thermal conductivity for the ultrasound transducer where an array with heat build up is being used.


Claims 10 – 11 and 13 – 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combined teachings of Bar-Cohen and Miller et al, since both teach use of combination acoustic backing layers with the layer apposing the transducer serving as a match to draw back-propagating energy into an absorptive stage, the former using a metallic first or near-transducer layer and a scattering interface to the absorptive layer and the latter teaching extending the matching backing and anechoic interface to an array construct.

Claims 12 and 17 – 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bar-Cohen and Miller et al as applied to claim 11 above, and further in view of Frey as the latter is applied above regarding use of aluminum alloy in a backing layer for the advantage that such a backing block layer would provide a greater thermal conductivity.

Any inquiry concerning this communication should be directed to Jaworski Francis J. at telephone number 571-272-4738.

FJJ:fjj

01032006



Francis J. Jaworski  
Primary Examiner